



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/849,065	05/04/2001	Ward Dean Halverson	101430-0131	8164

21125 7590 03/24/2004

NUTTER MCCLENNEN & FISH LLP
WORLD TRADE CENTER WEST
155 SEAPORT BOULEVARD
BOSTON, MA 02210-2604

EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
----------	--------------

1762

DATE MAILED: 03/24/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/849,065

Applicant(s)

Ward D. Halverson

Examiner

M.L. Padgett

Group Art Unit

1762

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 7/23/03
- ☒ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-8, 10-28, 31-39 + 50 + 49 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-8, 10-19, 21-28, 31-39 + 49-50 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

Art Unit: 1762

1. Applicant's election without traverse of group I method claims 1-39 in Paper No. 8 (7/23/03) is acknowledged.

Applicant's election with traverse of species group II (ii) (a) of bioactive organic coatings in Paper No. 8 (receipt date 7/23/03) is acknowledged. The traversal is on the ground(s) that both organic and inorganic compounds can be bioactive, as can specific hydrocarbon compounds. This is not found persuasive because the species requirement between organic and inorganic has nothing to do with bioactivity, but that there is different chemistry involved between these two categories of compounds, and applicant has provided no reasons to believe that all inorganic compounds would be effected equivalently to organic ones. Also a proper traversal of a species requirement is to say that one species is just an obvious variation of the other, and applicant has not done this.

Concerning bioactive verse hydrocarbons and derivatives, while some hydrocarbons may be bioactive by some definition, not all hydrocarbons would necessarily be considered so, and the PTO can not test them to find out which are and are not, so generic hydrocarbons not identified by bioactivity, would require different consideration than bioactive organic molecules. It is noted that the essence of applicant's arguments, appears to be that they are arguing that their own Markush groups, as in claim 21, are improper.

The requirement is still deemed proper and is therefore made FINAL.

2. Applicant's statements of clarification, with regard to claims 4 and 8, are considered satisfactory and provide file wrapper estoppel to the limitations of these claims. All the outstanding 112 rejections have been overcome.

Art Unit: 1762

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 49-50, 1, 3-4, 8, 10-12, 19, 21, 27-28 and 31-32 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yamazaki (5,601,883).

Yamazaki (883) teaches ECR plasma cleaning and coating of plastic objects plural or singular, such as screws, gears, the external surfaces of ballpoint pens or mechanical pencils, as in Fig. 1, described on col. 3, or the external surfaces of cylindrical drums (metal cylinder coated with a dielectric resin insulating layer) as in Fig. 5, described on col. 7, lines 34⁺, where col. 8, lines 7-14 notes that alternatively plural cylinders may be treated. Any of the pens, mechanical pencils exteriors or the cylindrical drums explicitly read on the claimed tubular articles, and for the drums, the surface, which is being deposited on, is non-conductive. Also see the abstract; Fig. 2-3 and col. 4, lines 21-65 for magnetic field conditions that meet ECR requirements.

Yamazaki (883) employs a processing sequence that initially uses a gas, such as Ar, He or H₂, at 10⁻⁴ torr in their microwave ECR (2.45 GHz; about 2kGauss and 500W) plasma to clean the substrates, i.e., treat, then a deposition gas mixture exemplified as C₂H₂, or C₂H₄ and/or CH₄, and H₂ gas is added to the system, with the pressure maintained at 0.1 to 300 torr (3-30 preferred

Art Unit: 1762

and 10 torr exemplified), to deposit a hard protective carbon film. Analogous deposition sequence as may also be found on col. 5, lines 35-67; and on col. 6, lines 1-40⁺, but with higher power (1 KW). Note that the taught frequency and magnetic field parameters, approximately meet the requirements of the equation of claim 8, as they must to be producing the taught ECR conditions. Note the radiation from the plasma will inherently have a sterilizing effect.

5. Claims 16-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamazaki (883) as applied to claims 1, 3-4, 8, 10-12, 19-21, 27-28, 31 and 49-50 above.

When treating plural objects, Yamazaki teaches placing them loose in hollow cylinder 10 of steel or quartz, which is turned by means of a motor and gear at 0.1-10 rpm during processing while plasma gas flows through the system, thus moving the substrate through the plasma in order to effectively treat, then coat their entire external surfaces, as the exposed surfaces are always changing during treatment. In the sense of the term that means to cause to move through, Yamazaki's substrates may have been considered to have been "drawn" through the plasma, where the motive force therefore is constant, hence uniform, but the tumbling action is randomized. The alternate embodiment of Fig. 5, provides for both axial rotation and if the "substrate is some what long", there is provided "a means for moving the substrate in the axial direction...", which also reads in a sense on the claimed "drawing".

Alternately, if one considers drawing to require a pulling action to cause the movement through the plasma, Yamazaki's disclosure does not teach this, however one of ordinary skill in the art would recognize that relative movements as discussed by Yamazaki may be produced by

Art Unit: 1762

pull or pushing forces, and apply routine engineering to use either such means to produce the motions required by Yamazaki's process in order to effectively coat entire surfaces as required.

6. Claims 5-7, 13-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (883) as applied to claims 1, 3-4, 8, 10-12, 16-17, 19-21, 27-28, 31 and 49-50 above.

The specific parameters of these claims and the graded treatment are not disclosed, however Yamazaki's exemplary cleaning plasma's pressure of 10^{-4} torr (i.e. 0.1 mtorr) is only insignificantly lower than the end point for applicant's range of 0.1 Pa – 1000 Pa (i.e. 0.75 mtorr-7.5 torr), as it would have been obvious to one of ordinary skill in the plasma art to optimize treating pressures for variations in chamber configuration and gases used, and because Yamazaki (883) also teaches use of higher pressures (0.1 –300 torr, ex-amplified by 10 torr) when further processing, thus suggesting the effectiveness of these higher pressure in causing treatment. Note the claimed 1000 Pa = 7.5 torr, thus these teachings are suggestive of the plasma's usefulness over the entire pressure range claimed. While Yamazaki only use the upper range of applicant's claimed power, they discuss how use of different powers effects the microstructure of deposits, and teach varied use of power for different gases, as well as for different results (col. 5-6), hence it would have been further obvious to optimize power according to these considerations. Also, the power used will be varied according to the size of the plasma zone in which plasma needs to be produced, i.e. according to the required plasma density, hence optimization would have been made according to that need.

Art Unit: 1762

7. Claims 2, 15, 21-28 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (883) as applied to claims 1, 3-8, 10-14, 16-21, 27-28, 31 and 49-50 above, and further in view of Subramanian, optimally considering Kieser et al and/or Wilhelm.

Yamazaki (883) only discusses treating and coating the exteriors of his tubular substrates, and does not coat with the types of bioactive agents claimed by applicant. Subramanian was discussed in section 11 of paper #6 (mailed 2/21/03), as supplying teaching of plasma treating substrates, inclusive of tubes, exterior and/or interiors, for coating with materials as claimed.

It would have been obvious to use the Yamazaki ECR microwave plasma technique for the plasma pretreatment of Subramanian, because it has been shown effective and desirable for treating plastic substrate of 3-demenstional shape consistent with the type suggested by Subramanian, the taught useful gases of both references as overlap, hence the gases of either would have been expected to be effective for producing taught effects, when employed in Yamazaki's plasma apparatus, with optimization for desired chemical effects, especially as the plasma temperature Yamazaki teaches for plastic treatment would have been desirable for the plastic substrates of Subramanian, and Yamazaki's teaching is applicable to essentially any shape of small objects, including small tubes.

Kieser et al (discussed in section 11 of paper #6, mailed 2/21/03) and Wilhelm (section 8⁺ of paper #6) are cumulative to the above rejection, as they provide further means for treating tubular shapes as suggested by Subramanian, in ECR plasma as taught by Yamazaki et al. Kieser et al demonstrates a continuous shape pulled through the ECR microwaves chambers, which is an extension of the discussion in Yamazaki of axial movement. Wilhelm demonstrates treatment of interior of tubes, which is relevant to the embodiment of Yamazaki et al which

Art Unit: 1762

treats many objects inside a cylinder, i.e. tube, hence with the motivation of Subramanian to treat insides of tubes, then Wilhelm would provide Yamazaki et al with further configurations to achieve such treatment, especially when noting that Yamazaki produces ECR plasma inside their cylinders which may be steel or quartz. Hence, Yamazaki provides the expectation that Wilhelm's process of coating interior of tubes would have been effective on plastic tubes with Yamazaki's technique.

8. Claims 21-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (883) in view of Subramanian, optionally considering Kieser et al or Wilhelm as applied to claims 1-8, 10-19, 21-39 and 49-50 above, and further in view of Williams et al (4,927,676) or Makker et al (5,942,277) or Narayanan (5,486,357) as discussed in section 10 of paper #6, mailed 2/21/03.

The rejection is cumulative to the above rejection particularly for considering deposition of bioactive materials inside of tubular substrates, when employing plasma pretreatment, with reasons for combining conceptually as previous by discussed. Note that all of these ternary references and Subramanian teach either generic plasma or RF, and that the microwave range taught by Yamazaki is formally part of the RF range, hence may be suggested thereby.

9. Other art of interest include Yamazaki 4,760,008 and 5,013,579, treating more cylindrical or plural plastic substrates by ECR plasma.

10. Applicant's arguments with respect to claims 1-8, 10-19, 21-39 and 49-50 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 1762

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on Monday-Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Beck Shrive can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Padgett/LR
March 10, 2004
March 23, 2004

A handwritten signature in cursive script, reading "Marianne Padgett". The signature is written in black ink and is positioned above the printed name and title.

**MARIANNE PADGETT
PRIMARY EXAMINER**